

# Abstract

An electric arc welding system and method for creating a first AC welding arc with a first current waveform between a first electrode and a workpiece by a first power supply and a second AC welding arc with a second current waveform between a second electrode and a workpiece by a second power supply as the first and second electrodes are moved in unison along a welding path where the first and second power supply each comprising an high speed switching inverter creating its waveform by a number of current pulses occurring at a frequency of at least 18 kHz with the magnitude of each current pulse controlled by a wave shaper and the polarity of the waveforms controlled by a signal. The first and second AC waveforms each have a positive portion and a negative portion and a cycle period of about 10-20 ms and timing circuits for determining the push and pull times between the arcs and a waveform adjusting circuit to limit the push and pull times to less than about 5.0 ms.